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NOTES ON THE HABITS OF SCELOPORUS UNDULATUS (LATREILLE).

This exceedingly common lizard is chiefly found on trees and fences, or very rarely on the ground. They are rather agile and difficult to capture save with a noose. They do not, as a rule, go into holes when hard pressed, though I have seen one hide under the loose bark of a stump. They show a certain amount of color change from lighter to darker and vice-versa.

Breeding-habits. A ♀ caught on May 10, 1914, at Marlton, N. J., was killed and dissected on June 7th. She had 10 large eggs in her oviducts. My earliest record for young is July 29th (Nelson County, Va.), but I have no other records before Aug. 14. I have never seen any half-grown ones except in the very early summer, so that I think this lizard reaches adult size in one year.

Food. One of my earliest remembrances of this lizard is seeing a large one run up a pine tree carrying in its mouth a cricket as large as its own body. In captivity I have watched them eat butterflies of the genera Pieris and Colias, houseflies and Mayflies. Specimens were hardy in captivity, and excellent feeders, chasing and snapping up the small butterflies with great agility, and swallowing them with a chewing motion.

E. R. Dunn,
Philadelphia, Pa.

HIBERNATION OF REPTILES IN SOUTHERN CALIFORNIA.

Of the snakes in the immediate vicinity of Los Angeles, very few are to be found at large during the winter, for they behave much as do their eastern cousins. This was contrary to my expectations when I first arrived here, for like many another easterner, I thought Southern California would yield a bountiful harvest of snakes at any time of the year. Now and then a Pacific Bull Snake (*Pituophis catenifer*), a Western Garter Snake (*Thamnophis parietalis*), or a "Water" Snake (*Thamnophis hammondi*) will wander in search of food and may be found abroad even in winter. Only exceptionally warm days will cause this, however, and few, if any, other snakes ever come out in the winter. Most captives in my collection of local snakes refuse food from about the middle of October to the beginning of March.

Lizards, on the contrary, are to be found on any sunny day during the winter when they come forth to warm themselves after a freezing night. At such times they snap up occasional flies and other insects. *Gerrhonotus scincicauda, Uta stansburiana* and *Sceloporus bi-seriatus* are the most intrepid of the lizards that dare the rigors of a none-too-gentle climate and warm themselves in the rays of the winter sun. Up in the mountains where snow falls during the winter, one may see the hardy little swifts (*Uta*) scamper about rocks in the sun a few feet away from shady nooks where large patches of snow lie evaporating, while down at a lower altitude may be found other lizards, and even snakes at times. In captivity the lizards feed readily through the winter.

The hiding places of lizards may easily be found in the winter by overturning heaps of boards, stones, logs, etc. At that time of the year, especially after a heavy frost, they are easily captured, for they are quite sluggish. The Horned Lizards usually bury themselves in the ground, where they are sometimes

dug out accidentally. Snakes in this part of the country hibernate under haystacks, piles of boards, etc., but usually they seem to pass the winter in gopher and ground squirrel holes in the ground.

Between last Christmas and New Years I caught one "Water" Snake and one Western Garter Snake on a particularly warm day in a valley between the city of Los Angeles and the ocean. Near Dulzura I caught one more "Water" Snake and this winter received two small unidentified snakes from Calexico, where there is an arid tropical climate. Even in the desert around Calexico, snakes are more scarce in winter than they are in summer; though, if the truth must be told, they are not plentiful there at any time.

I have not known of any case of *Clemmys marmorata*—Southern California's only turtle—being found in the winter.

PAUL D. R. RÜTHLING,
Los Angeles, Calif.

COLUMBUS ON THE REMORA.

In the Journals of the first and second voyages of Columbus are found respectively descriptions of a species of Trunk and Sucking-fish observed near Cuba. The account of the latter mentions that the "Reversus," or Remora, was employed by the Indians in a singular manner of fishing which consisted in holding the "huntsman-fish" fast by a cord, and allowing it to attach itself to the bodies of other fish or large marine turtles. Humboldt conjectured the "Reversus" to be identical with *Echeneis naucrates*, Poey with the species named by him *E. guaicano*. Pre-Linnean writers on ichthyology continued to apply the term "Reversus" to the species of Sucking-fish described by Columbus, and also included under the same term a spinous variety, or "species," which is easily recognizable from the descriptions and figures as *Diodon histrix*. The use of the Remora as a "huntsman-fish" in the manner first related by Colum-

bus seems to have continued until modern times in various quarters of the globe; so at least the writer is informed by Dr. E. W. Gudger, who has collected a number of reports to that effect.

CHARLES R. EASTMAN,
New York, N. Y.

CERTAIN FAMILIAR STRUCTURAL ADAPTATIONS IN FISHES.

That habit and structure are correlated will be questioned by no student of evolution. That habit determines structure would probably be less widely conceded. If it does so, specialized structures would be expected to arise among fishes already possessing habits to take advantage of them; we would expect to find the habit served by a fish's peculiar structure, shared also, to some degree, by its relatives which lack the structure; and notable cases where this expectation is realized are evidence that structure is determined by habit.

Some such cases come to mind. The sailfish, remarkable for its great expanse of dorsal fin, is said to come to the surface of the sea with the fin out of water, functioning as a sail in the wind. The sword-fish and mackerel, its allies, are surface fishes, the sword-fish at least often swims with its back-fin out of water.

The prehensile tail of the sea-horse with which it coils around and holds fast to sea-weed is a structure unique among fishes. The pipe-fishes, its nearest allies, live among sea-weed twisting their lithe bodies among and bracing their tails against the strands of weed.

The highly developed breast-fins of the flying fish which enable it to travel considerable distances through the air and elude predaceous fishes of which it is the prey, is one of the most remarkable structural adaptations to be found in the world's ichthyfauna,

and perhaps responsible for the success, measured by the abundance, of flying fishes off shore over warm seas everywhere, where they seem to outnumber the sum of all other species. Their allies, the slender, elongate needle-fishes, though lacking any wing development are noted for the habit of leaping and skipping over the surface of the water. One elongate species with a much flattened body turns on its side and skims over the surface like a skipping stone.

J. T. NICHOLS,
New York, N. Y.

RANA PALUSTRIS IN WISCONSIN.

During the early fall of 1914, three specimens of *Rana palustris* Le Conte were found in a small stream entering the south side of Lake Wingra, Dane County. These specimens were identified for the writer by Dr. A. G. Ruthven, and a specimen was deposited in the Museum of Zoology, University of Michigan. The stream in which these frogs were found is the small sluggish outlet of a large swamp situated about a half mile from the lake. The bottom of the stream is of soft mud, without stones of any sort, and at all seasons of the year is more or less obstructed by a heavy growth of water cress. *Rana pipiens, Acris gryllus* and *Rana clamitans* are very commonly found here, but frequent and diligent search throughout the year previous had failed to disclose any pickerel frogs.

The distribution of this species is given by Dickerson (The Frog Book) as "over the eastern part of North America, west to the Great Plains, and north to Hudson Bay." Higley (Wisconsin Academy of Sciences, Arts and Letters, VII, 169) states that it is quite common in Michigan, and may possibly be found in Wisconsin; and in "The Herpetology of Michigan" (Mich. Geol. and Biol. Surv., Pub. 10, Biol. Ser. 3) Thompson and Thompson say that they

have examined specimens from six counties in Michigan and have records of the occurrence of the species in three others. No records are given for any part of the state above the southern end of Saginaw Bay. Cope (Batrachia of North America, 1889) gives two records for Wisconsin, one from the Root River, 1853, and the other from the Upper Wisconsin River, the date of which is not given. Notes on the occurrence of the species at Green Lake, Wisconsin, in 1906 and 1909, have been given to me by Mr. John M. Lowe. The results of ecological work in the region of the Madison lakes will doubtless show that *Rana palustris* although rare, has a fairly continuous distribution in the state.

THURLOW C. NELSON,
University of Wisconsin.

SOME NEW RECORDS FOR GYRINOPHILUS PORPHYRITICUS (GREEN).

In rearranging the collection of Amphibia in the Lee Museum of Biology at Bowdoin College, I came across a badly shrivelled and faded specimen of this species. It was easily identified by the teeth and the general appearance, but the only data with it was a card marked Brunswick, Me.

There are two more recent records from Manchester, Maine.

August 16, 1913, George E. Gilbert brought me two specimens, an adult, and a larva about three inches long, with external gills.

April 12, 1915, the same collector got three adults, two of them 7¼ inches in length. A week later I visited the place where they were found, a cold spring rising in a barrel in an open field and emptying into a stone drain. One had been found in the mud under the board cover of the spring, while the others were in the water. They seem to be good

swimmers, but in captivity I noticed that they rested with the nose held out of water.

At the mouth of the stone drain, about 100 yards from the spring, I found a larva three inches long, and in the spring itself five more only on inch in length, The large larva was probably a year old, while the small ones appeared to be newly hatched. In color they were a pale red with small yellowish dots scattered along the back, but there is little pigment in the skin and the whole animal is quite translucent.

In the shape of the head, thread-like external gills and general form these larvæ resemble those of *Spelerpes bilineatus*, but the color and markings are quite different.

Although this species seems to be quite abundant about this one spring, I have found it nowhere else in the vicinity.

PHILIP H. POPE,
Manchester, Maine.

NUMBER OF YOUNG PRODUCED BY COMMON SNAKES.

Mr. J. F. Street informs me he dissected an adult garter snake (*Thamnophis sirtalis*) in the fall of 1909, obtained at Indiana, Pa. It contained 65 well-developed embryos. I saw an example of this species in the Carnegie Museum, at Pittsburgh, some years ago, from Ohio Pyle, Pa. It had a great number of young which were given as 65. The largest water snake (*Natrix sipedon*) I have examined, was obtained by Evan Rhoads on Newton Creek, near Mount Ephraim, Camden County, N. J., August 22, 1912. When fresh it was little short of five feet, and contained over 70 young, (76 according to my notes). I may add that a red-eared terrapin (*Pseudemys elegans*) was captured in Oldmans Creek, N.

J., during June, 1914, and brought to my notice through Dr. Ida A. Keller. It is doubtless an introduction or escaped individual, as the species is a native of the Gulf States.

HENRY W. FOWLER,
Philadelphia, Pa.

Edited by J. T. NICHOLS, American Museum of Natural History

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